# Inflight Icing German ALPA's (VC – Vereinigung Cockpits´) Point of View

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on behalf of

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# Inflight Ice Detection

- Concerns installation and use of ice detection systems in modern jet aircraft from the pilots´ point of view.
- By Mark Hartmann Capt A320 on behalf of Capt. Peter Krupa also A320±1.

# Main Points

- A short history of how ice accretion was assessed in the past.
- Status quo of ice detection in modern jet cockpits.
- A short discussion of what equipment would be useful from the pilots` point of view.

# History

- Indirect ice assessment e.g. any specific part of the airframe prone to icing
- Ice on indicator => ice on wings => activated wing anti-ice
- Disadvantages: Indicator cannot be seen during darkness (=50% of flying time in winter!) Illuminated pins were inadequate consequently pilots pragmatically used their flashlights

# Status quo: Cockpit Spectacle

Dark Cockpit

A busy flight crew

One pilot flying.

The other pilot operating systems broadcasting

and and and ...

illuminating the darkness with a two cell battery flashlight


„Aah, yes Ice“

**„De-ice!“**

and now ...

How much *renewed* icing is there?
(The indicator was not deiced!)

- What are the present thoughts and suggestions of German ALPA pilots ...

# Background Info

- Questionaire distributed on a random basis to 400 German ALPA (VC) pilots.
- Additionally to 120 „actives“ (working group members).
- Simple to use, multiple choice, with as little need for free text as possible.

# The questionaire and the replies

- as a percentage evaluation
- quotes from the free text responses

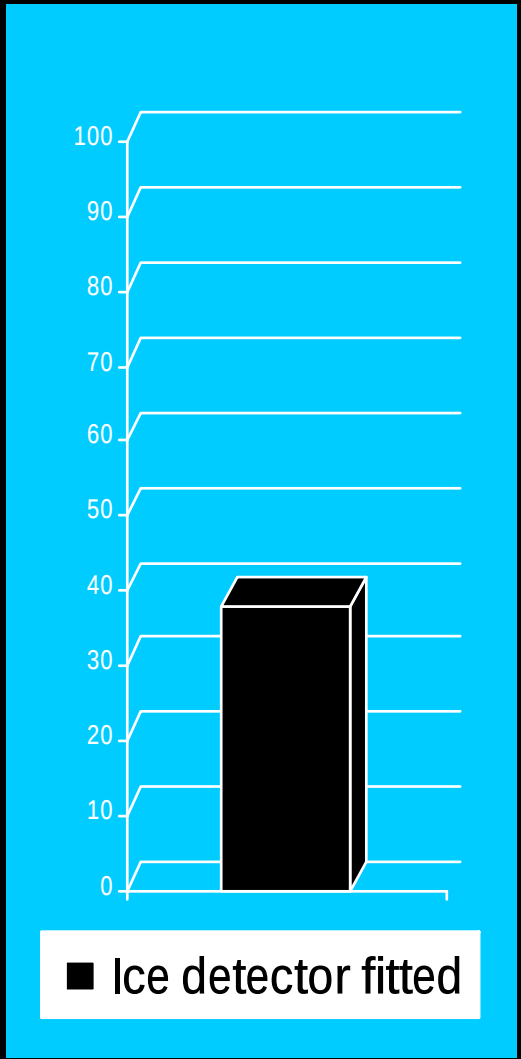
# Q1:
# Type of a/c flown

A representative cross section of Airbus, Boeing and Canadair pilots

# Q2.1: Is the respective a/c fitted with an ice detector?

**38%**
respondents had it **fitted**.

(We expected a max of 10%.)



# Q2.1.2:
# What does it indicate ?

1. Engine Icing Conditions
2. Actual Engine Ice
3. Wing Icing Conditions
4. Actual Wing Icing

All four choices indicated more or less the **same value**.

# Q2.1.3:
# Ice Detector Experiences ?

**Mostly positive:**

- *Reliable*
- *Helpful in darkness*
- *Good reminder or an „attention getter“*
- *Easy to use*
- *Sensitive*
- *Early warning*

**Negative comments:**

- *Unreliable*
- *Slow detection*

# Q2.1.4:
# Is it reliable?

Yes
69%.

# Q2.1.5:
# Is it used as a primary means of detection or not ?

**44%** use it

as primary means of detection

# Q2.2:
# A/c not fitted with an ice detector

# Majority 62%!

# Q2.2.1: How do you assess icing (conditions)

- Windshield wipers
- Special ice detection pins
- Observing the rims of the (even if heated) windshield
- Observing wing leading edges in as far as they can be seen
- Meteorolgical clues; temp., vis. Moisture, METARS & TAF‘s

# Astounding!

Nobody mentioned PIREP‘s

# Q2.2.2:
# Is judgement based on previous criteria satisfactory?

**NO**

**82%**

# Q2.2.3:
# Do you have problems in the dark?

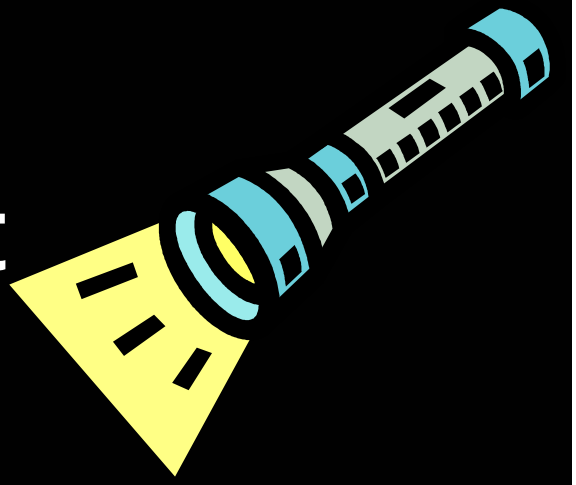
**Definitly**

**88%**

# Q2.2.4
# How do you solve it?

**Mostly:**

**Flashlight**



**Few:**

**Wing lights**

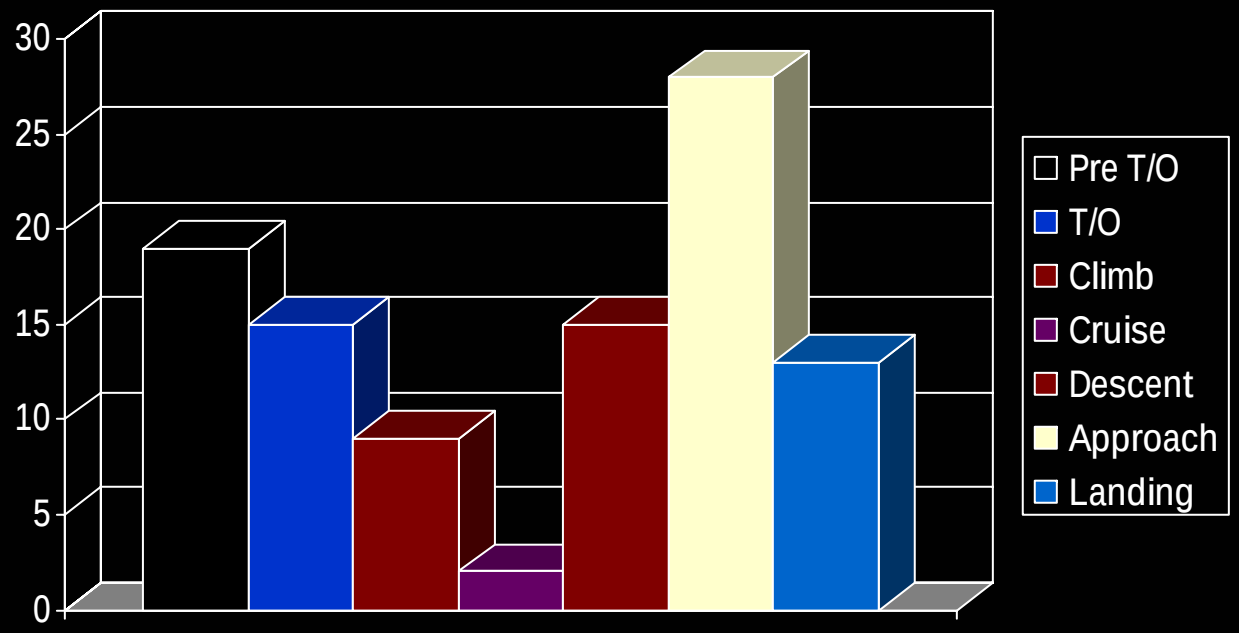
**Ice detection pin internal lighting**

# Q2.2.5
# Would you like to have an ice detector?

**Yes, yes, yes**

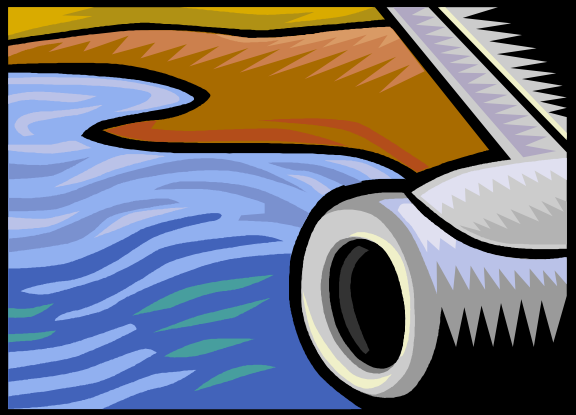
**91%**

# Q3
# Most critical phase of flight



# Q4
# Rated importance of an inflight icing detector

# 7,1 / 10



# Q5
# Rated importance of a ground icing detector

# 6,5 / 10

# Q6
# De-icing System

Passive (emits a warning) or

Active (ice detector switches the de-icing system automatically)

**Passive 31%**

**Active 69%**

# Q8
# Have you ever flown in severe icing?

**62%**

# Q9
# Have you ever had control problems due to icing?

**13%**

# Q7
# Your ideal De/Anti-Icing System?

- **Reliability**
- **Ability to assess ground icing conditions**
- **Indicates icing on parts not visible from the cockpit e.g. stabilizer**

# Q7 cont: Your ideal De/Anti-Icing System?

- **Simple to use and easy to understand**
- **Qualitative feedback on severity of icing**
- **Indicate when it is on unnecessarily**
- **Optical and acoustic output**

# Summary

- No vital need for ice detectors on big jets
- Would increase safety
- Ease operations
- The technology is available

- Pilots want ice detectors

# Conclusion

**An appeal by the pilots to the relevant authorities**

**Require aircraft to be fitted with ice detectors**

# Thank you for listening!

- Peter Krupa can be reached by e-mail: peterkrupa@t-online.de

# An Appeal!

## Tailplane Icing Specialists

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